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10/671,126

09/25/2003

Oleg Logvinov

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EXAMINER

MUI, GARY

ART UNIT

PAPER NUMBER

2616

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|-------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/671,126 | Applicant(s) LOGVINOV ET AL. | |
| | Examiner Gary Mui | Art Unit 2616 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1 and 13 – 22 are objected to under 37 CFR 1.75 because of the following informalities:

For claim 1 line 3, the occurrence of “at at” seems to be a typo, it is suggested to the applicant to remove one “at”. Similar problem exists for claim 13 line 4.

Claims 14 – 22 are objected to because they depend on an objected claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Litwin, Jr. et al. (US 6,834,091 B2).

For claim 1, Litwin, Jr. et al. teaches that at least one of the PLC nodes, establishing a timing controlled PLC data signal communication frame, wherein the frame includes synchronization data and has a predetermination duration (see column 1 lines 60 – 67); transmitting the frame onto the PLC system at predetermined intervals (see column 2 lines 1 – 5); and transmitting PLC signals among the PLC nodes in accordance with the timing frame (see column 2 lines 5

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- 7, the master device is sending synchronization information to the plurality of devices and then the devices transmit during its time slot).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2 – 7, 8 – 18, and 20 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litwin, Jr. et al. in view of Schobinger et al. (Non Patent Literature/A Low-cost Point-to-Multi-point Access System based on OFDM Transmission).

For claim 2, Litwin, Jr. et al. teaches establishing a timing controlled PLC data signal communication frame having a predetermined duration (see column 1 lines 60 – 67); selectively allocating a first portion of the duration of the timing frame to the downstream time slot and a second portion of the duration to the at least one upstream time slot; transmitting the frame onto the PLC system at predetermined intervals (see column 2 lines 1 – 5); and transmitting PLC signals between the head-end and at least one of the remotes in accordance with the timing frame (see column 2 lines 5 – 7, the master device is sending synchronization information to the plurality of devices and then the devices transmit during its time slot). Litwin, Jr. et al. fails to teach the timing frame includes a downstream time slot assigned for transmission of PLC data signals from the head-end to at least one of the remotes and at least one upstream time slot assigned for transmission of PLC data signals from at least one of the remotes to the head-end. Schobinger et al. from the same field of endeavor teaches granting upstream-transmission for several slaves can be done in one slot transmitting slave address and corresponding upstream-slot numbers (see page v - 418 column 2 lines 42 – 44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the timing frame of Litwin, Jr. et al. to include time slot assignment information as taught by Schobinger et al. The motivation for doing this is to have an efficient communication system by avoiding collisions.

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For claim 13, Litwin, Jr. et al. teaches a head-end PLC transceiver (see figure 1 box 14) coupled to a plurality of remote PLC transceivers (see figure 1 boxes 16 and 18) over a PLC network wherein the head-end transmit downstream data signals for reception at least one of the remotes and at least one of the remotes transmits upstream data signals for reception at the head-end in accordance with a timing controlled PLC data signal communications frame having a predetermined duration and wherein the head-end transmits the frame onto the PLC system at predetermined intervals (see column 2 lines 1 – 7). Litwin, Jr. et al. fails to teach the timing frame includes a downstream time slot assigned for the downstream data signals and at least one upstream time slot assigned for the upstream data signals, wherein the downstream time slot occupies a first portion of the duration of the timing frame and the upstream time slot occupies a second portion of the duration of the timing frame and wherein the lengths of the first and second portions are selectable. Schobinger et al. from the same field of endeavor teaches granting upstream-transmission for several slaves and be done in one slot transmitting address and corresponding upstream-slots numbers (see page v - 418 column 2 lines 42 – 44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have timing frame of Litwin, Jr. et al. to include time slot assignment information as taught by Schobinger et al. The motivation for doing this is to have an efficient communication system by avoiding collisions.

For claims 3, 4, 14, and 15, Litwin, Jr. et al. teaches the PLC system is a frequency division multiplexing system and that the frequency division multiplexed system is an orthogonal frequency division multiplexed (“OFDM”) system (see column 4 lines 17 – 18).

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For claims 5 and 16, Litwin, Jr. et al. fails to teach the head-end transmits an OFDM PLC signal simultaneously to a plurality of the remotes, wherein the OFDM signal contains an OFDM symbol for each of the remotes, each of the OFDM symbols contain at least one predetermined tone and the at least one tone is different for each of the remotes. Schobinger et al. teaches with orthogonal sub-carriers the required signal processing in transmitter and receiver can be realized with a discrete Fourier transform (IDFT/DFT) (see page v - 418 column 1 lines 4 - 6). Schobinger et al. also teaches registered slaves are polled in a periodical scheme whether they have a transmission request and to scan their status. This requires one slot taking the time of one OFDM-block, as different slaves can't share one OFDM-block (see page v - 418 column 2 lines 37 - 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to transmit OFDM signals simultaneously and each remote have its own tone as taught by Schobinger et al. into the PLC system as taught by Litwin, Jr. et al. The motivation for doing this is to provide for a higher throughput and a more efficient transmission.

For claims 6 and 17, Litwin, Jr. et al. fails to teach the first portion is not equal to the second portion. Schobinger et al. from the same field of endeavor teaches asymmetric data-rate between up-link and down-link should be possible (see page v - 418 lines 3 - 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have an asynchronous transmission as taught by Schobinger et al. into the PLC system as taught by Litwin, Jr. et al. The motivation for doing this is to have a higher throughput communication system.

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For claims 7 and 18, Litwin, Jr. et al. fails to teach the selectively allocation the duration of the timing frame includes dynamically changing the size of at least one of the first and second potions. Schobinger et al. from the same field of endeavor teaches options to use reduced data-rates communication with slaves having a very bad channel. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to adjustable sizes as taught by Schobinger et al. into the PLC system of Litwin, Jr. et al. The motivation for doing this is to have a more efficient transmission system by allowing for the saving bandwidth.

For claims 9 – 11 and 20 – 22, Litwin, Jr. et al. fails to teach transmitting from the head-end a downstream orthogonal frequency division multiplexed (“OFDM”) data signal having a first number of carriers and a first symbol length, transmitting from at least one of the remotes an upstream OFDM signal having a second number of carriers and a second symbol length, wherein the first number of carriers is greater than the second number of carriers and the first symbol length is longer than the second symbol length; a plurality of the remotes transmits OFDM data signals and wherein the first symbol lengths exceeds the sum of the second symbol lengths for the OFDM signals transmitted by the respective plurality of the remotes; and wherein the head-end can only decode an OFDM data signal having a number of carriers and a symbol length substantially different from the first number of carriers and the first symbol length, respectively, and wherein at least one of the remotes can only decode an OFDM data signal having a number of carriers and a symbol length substantially different from the second number of carriers and the second symbol length, respectively. Schobinger et al. also fails to explicitly teach it but it is inherent in Schobinger OFDM system to have

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multiple carriers and symbol lengths. It is also inherent that in a point-to-multipoint system that there will be more carries on one end then the other and the sum of the symbol lengths be greater; also when there is more then the head-end or remote can only decode when the number or carriers and symbol lengths are different. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have different symbol lengths. The motivation for doing this is allow for a larger and effective communication system.

For claim 12, Litwin, Jr. et al. teaches the timing frame is a time division multiplexed PLC data signal communication frame (see column 3 lines 53 – 55).

For claim 23, Litwin, Jr. et al. teaches a PLC transmitter module for generating and transmitting downstream PLC signals (see figure 1 box 20 of box 14) to at least one of at least one of a plurality of remote PLC transceivers (see figure 1 boxes 16 and 18) coupled to the head-end over a PLC network; a PLC receiver module for receiving upstream PLC signals transmitted from at least one of the remotes (see figure 1 box 20 of box 14); and the PLC transmitter module computes a timing controlled PLC data signal communication frame having a predetermined duration (see column 1 lines 60 – 67). Litwin, Jr. et al. fails to teach the timing frame includes a downstream time slot assigned for transmission of PLC data signals from the head-end to at least one of the remotes and at least one upstream time slot assigned for transmission of PLC data signals from at least one of the remotes to the head-end, wherein a first portion of the duration of the timing frame is allocated to the downstream time slot and a second portion of the duration is allocated to the at least one upstream time slot. Schobinger et al. from the same field of endeavor teaches granting upstream-transmission for several

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slaves and be done in one slot transmitting address and corresponding upstream-slots numbers (see page v - 418 column 2 lines 42 – 44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have timing frame of Litwin, Jr. et al. to include time slot assignment information as taught by Schobinger et al. The motivation for doing this is to have an efficient communication system by avoiding collisions.

Claim Rejections - 35 USC § 103

8. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litwin, Jr. et al. and Schobinger et al. as applied to claims 2 and 13 above, and further in view of Balhut (US 6,778,550 B1).

For claims 8 and 19, Litwin, Jr. et al. and Schobinger et al. teaches all of the subject matter of the claimed invention with the exception of selectively allocating the timing frame includes determining an optimal size for at least one of the first and second portions based on at least one of upstream and downstream bandwidth utilization data. Balhut from the same field of endeavor teaches efficient bandwidth allocation is achieved by using variable length burst for upstream transmission. Rather than setting the length of each upstream burst at a fixed length, the length of each burst is determined in accordance with the actual bandwidth requirements of the transmitting end user terminal (see column 2 lines 41 – 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to determine an optimal size as taught by Balhut into the PLC systems as taught by Litwin, Jr. et al. and Schobinger et al. The motivation for doing this is to have an efficient transmission system.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rickard et al. (US 5,977,650), Brown (US 6,144,292), Sutterlin et al. (US 6,414,968 B1), Propp et al. (US 2004/0075535 A1), and Lockridge et al (US 200/0090994 B1) are cited to show a method and system for timing controlled signal transmission in a point to multipoint power line communications system.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary Mui whose telephone number is (571) 270-1420. The examiner can normally be reached on Mon. - Thurs. 9 - 3 EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SUPERVISORY PATENT EXAMINER